



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2007**

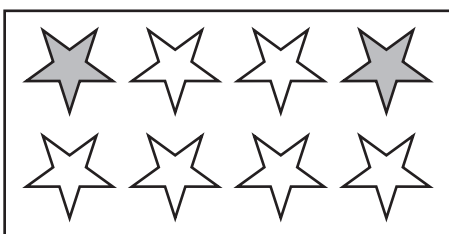
**Grade 5
Mathematics**

NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS

N&O 4.1 Demonstrates conceptual understanding of rational numbers with respect to: whole numbers from 0 to 999,999 through equivalency, composition, decomposition, or place value **using models, explanations, or other representations**; and **positive fractional numbers** (benchmark fractions: $\frac{a}{2}$, $\frac{a}{3}$, $\frac{a}{4}$, $\frac{a}{5}$, $\frac{a}{6}$, $\frac{a}{8}$, or $\frac{a}{10}$, where a is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationship in area, set, or linear models where the number of parts in the whole are equal to, and a multiple or factor of the denominator; and **decimals** as hundredths within the context of money, or tenths within the context of metric measurements (e.g., 2.3 cm) **using models, explanations, or other representations**.



- 1 Look at this set of stars.



What fraction of the set of stars is shaded gray?

- A. $\frac{1}{8}$
- B. $\frac{1}{4}$
- C. $\frac{1}{3}$
- D. $\frac{1}{2}$

**NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS**

N&O 4.2 Demonstrates understanding of the relative magnitude of numbers from 0 to 999,999 by ordering or comparing whole numbers; and ordering, comparing, or identifying equivalent proper positive fractional numbers; or decimals using models, number lines, or explanations.

- 2 Look at this table.

City Marathons

City	Number of Marathon Runners
Fairview	14,352
Glendale	14,400
Hastings	13,720
Irving	14,098

Which city had the largest number of marathon runners?

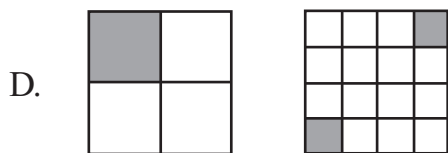
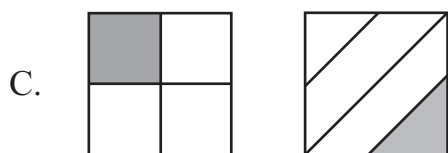
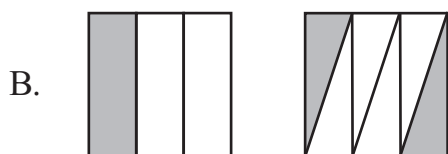
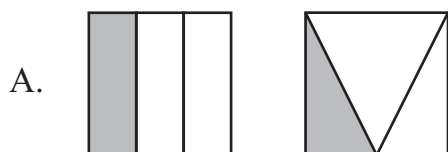
- A. Fairview
- B. Glendale
- C. Hastings
- D. Irving

NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS

N&O 4.2 Demonstrates understanding of the relative magnitude of numbers from 0 to 999,999 by ordering or comparing whole numbers; and ordering, comparing, or identifying equivalent proper positive fractional numbers; or decimals using models, number lines, or explanations.



- 3** Which pair of figures has the same fractional area shaded gray?

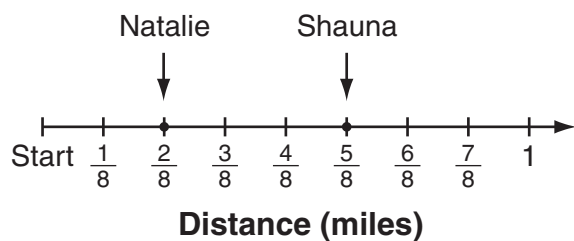


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GRADE 5 MATHEMATICS

N&O 4.3 Demonstrates conceptual understanding of mathematical operations by describing or illustrating the relationship between repeated subtraction and division (no remainders); the inverse relationship between multiplication and division of whole numbers; or the addition or subtraction of positive fractional numbers with like denominators using models, number lines, or explanations.



- 4 Shauna and Natalie ran a race. The number line below shows the distance each girl ran in four minutes.



What is the distance between Shauna and Natalie after four minutes?

- A. $\frac{1}{4}$ mile
- B. $\frac{3}{4}$ mile
- C. $\frac{3}{8}$ mile
- D. $\frac{7}{8}$ mile

**NECAP 2007 RELEASED ITEMS
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N&O 4.3 **Demonstrates conceptual understanding of mathematical operations** by describing or illustrating the relationship between repeated subtraction and division (no remainders); the inverse relationship between multiplication and division of whole numbers; or the addition or subtraction of positive fractional numbers with like denominators using models, number lines, or explanations.

- 5** Mrs. Sudha is filling snack bags. She always puts 3 cookies into each snack bag. She wants to find the number of snack bags she can fill using 36 cookies. The box below shows one way to solve the problem.

Count the number of times 3 can be subtracted from 36 until 0 is reached.

What is another way to solve the problem?

- A. Divide 36 by 3.
- B. Multiply 36 by 3.
- C. Divide the total number of students by 3.
- D. Multiply the total number of students by 3.

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GRADE 5 MATHEMATICS**

G&M 4.7 Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands.

- 6** Look at this chart.

Student	Height of Plant
Suzy	$\frac{1}{2}$ yard
Meg	15 inches
Rita	1 foot, 4 inches

Which list shows the students in order from the student with the shortest plant to the student with the tallest plant?

- A. Rita, Suzy, Meg
- B. Suzy, Meg, Rita
- C. Rita, Meg, Suzy
- D. Meg, Rita, Suzy

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F&A 4.1 Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables or sequences; and writes a rule in words or^{sc} symbols to find the next case.

- 7 If these patterns continue, which pattern will **not** contain the number 100?
- A. 2, 4, 6, 8, 10, 12, ...
 - B. 3, 6, 9, 12, 15, 18, ...
 - C. 4, 8, 12, 16, 20, 24, ...
 - D. 5, 10, 15, 20, 25, 30, ...

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F&A 4.4 **Demonstrates conceptual understanding of equality** by showing equivalence between two expressions using models or different representations of the expressions, by simplifying numerical expressions where left to right computations may be modified only by the use of parentheses [e.g., $14 - (2 \times 5)$] (expressions consistent with the parameters of M(F&A)–4–3), and by solving one-step linear equations of the form $ax = c$, $x \pm b = c$, where a , b , and c are whole numbers with $a \neq 0$.

- 8 The equation below represents the number of fluid ounces, f , in c cups of water.

$$f = 8 \times c$$

How many cups of water fill a container that holds 48 fluid ounces?

- A. 6 cups
- B. 40 cups
- C. 56 cups
- D. 384 cups

NECAP 2007 RELEASED ITEMS
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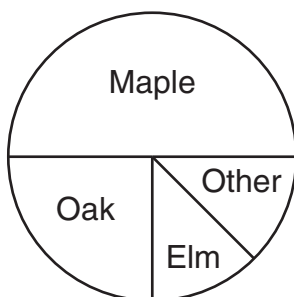
- 9 For a science project, Ms. Mullin put her class into 6 groups with 4 students in each group and no students left over. For a mathematics project, Ms. Mullin will put her class into groups with 2 students in each group and no students left over. How many groups of students does Ms. Mullin need for the mathematics project?
- A. 3
 - B. 4
 - C. 8
 - D. 12

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DSP 4.1 **Interprets a given representation** (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (IMPORTANT: *Analyzes data consistent with concepts and skills in M(DSP)–4–2.*)

- 10 Look at this circle graph.

Trees in Meadow Park



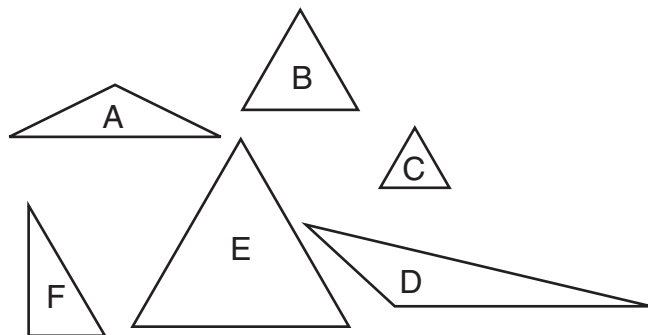
Meadow Park has 12 elm trees. About how many maple trees does Meadow Park have?

- A. 24
- B. 36
- C. 48
- D. 96

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G&M 4.5 Demonstrates conceptual understanding of similarity by applying scales on maps, or applying characteristics of similar figures (same shape but not necessarily the same size) to identify similar figures, or to solve problems involving similar figures. Describes relationships using models or^{sc} explanations.

- 11 Look at these triangles.



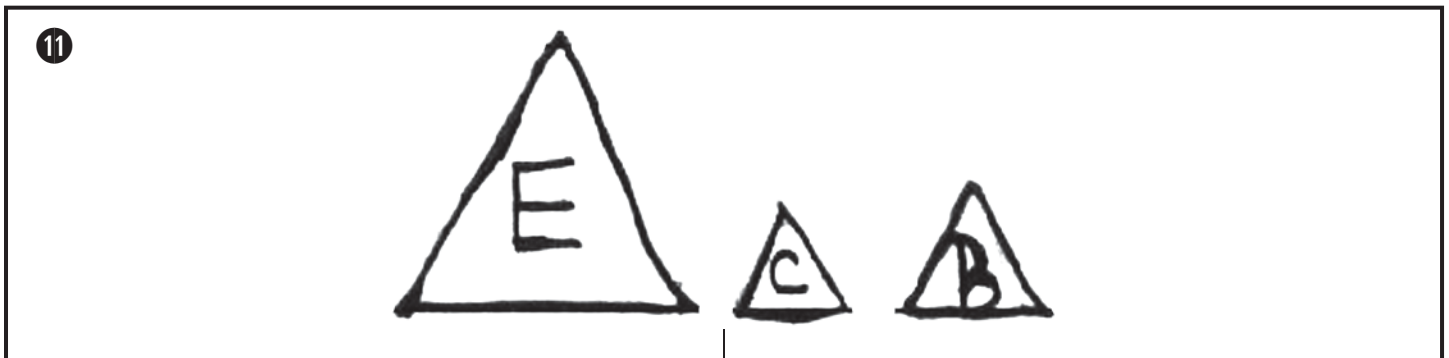
Which triangles are similar?

Scoring Guide

Score	Description
1	Student correctly lists the three triangles that are similar, (B, C, and E) .
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

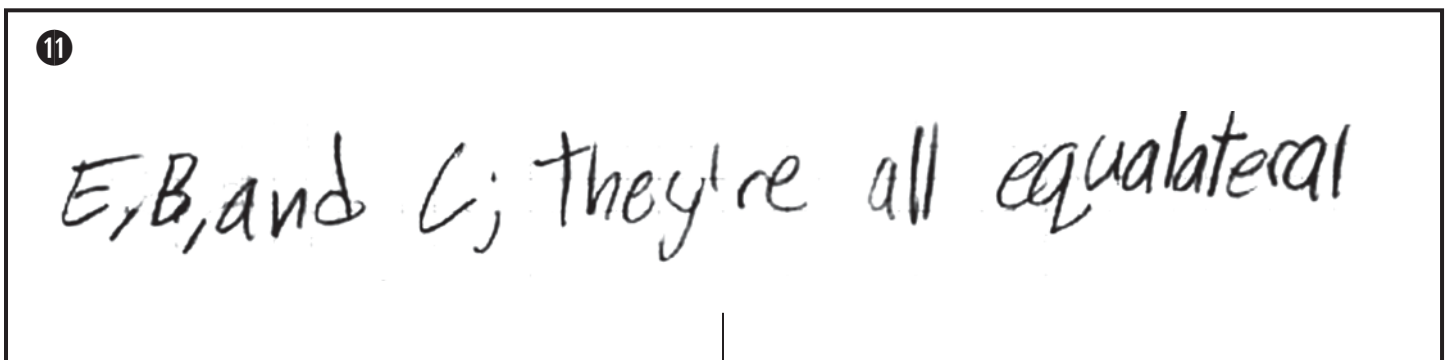
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SCORE POINT 1
(EXAMPLE A)



Student's response is correct.

SCORE POINT 1
(EXAMPLE B)



Student's response is correct.
(Explanation is not required.)

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SCORE POINT 0
(EXAMPLE A)

11

c is the smallest

Student's response is irrelevant to
the concept being measured.

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DSP 4.2 Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using measures of central tendency (median or mode), or range.

- 12** The list below shows the heights (in inches) of players on a basketball team.

56, 54, 57, 55, 56, 54, 61, 57, 56, 60, 56, 59

What is the range of these heights?

Scoring Guide

Score	Description
1	Student correctly gives the range, 7 (inches), or 54 (inches) to 61 (inches).
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS

SCORE POINT 1
(EXAMPLE A)

12

7 inches

Student's answer is correct.

SCORE POINT 1
(EXAMPLE B)

12

54 to 61

Student's answer is correct.

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GRADE 5 MATHEMATICS

SCORE POINT 0
(EXAMPLE A)

12

61

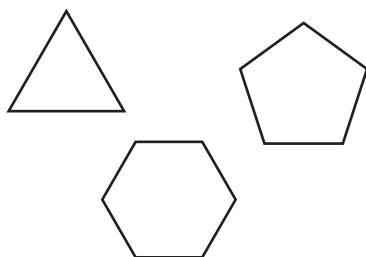
Student's answer is incorrect.

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G&M 4.1 Uses **properties or attributes of angles** (number of angles) or **sides** (number of sides, length of sides, parallelism, or perpendicularity) to **identify, describe, or distinguish among** triangles, squares, rectangles, rhombi, trapezoids, hexagons, or octagons; or classify angles relative to 90° as more than, less than, or equal to.



13 Look at these shapes.



- a. Use mathematical language to write **one** way all three shapes are different.
- b. Use mathematical language to write **one** way all three shapes are alike.

Scoring Guide

Score	Description
2	Student correctly answers both parts.
1	Student correctly answers one part.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Sample Responses:

Accept any of the following answers or any other correct answer.

Part a: The three shapes have different

- numbers of sides (one shape is a triangle, one shape is a pentagon, and one shape is a hexagon).
- numbers of angles.
- numbers of vertices.
- perimeters.
- areas.

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Part b: Each of the shapes

- has equal sides (equilateral).
- has equal angles (equiangular).
- is a (regular) polygon.

Note: Do not accept terms such as “points,” “lines,” or “slant.”

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SCORE POINT 2
(EXAMPLE A)



13

All the shapes have different amounts of vertices.

All the shapes are polygons

a) Student's answer is correct. (1 point)

b) Student's answer is correct. (1 point)

SCORE POINT 2
(EXAMPLE B)



13

a. The shapes all have a different number of sides.

b. The shapes have all equal sized side on their shape.

a) Student's answer is correct. (1 point)

b) Student's answer is correct. (1 point)

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SCORE POINT 1
(EXAMPLE A)



13

a. They have a different number of sides
b. They all have points.

a) Student's answer is correct. (1 point)

b) Student's response is insufficient. The explanation of "points" needs further clarification. (0 points)

SCORE POINT 1
(EXAMPLE B)



13

they all have equal sides

a) Student gives no response. (0 points)

b) Student's answer is correct. (1 point)

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GRADE 5 MATHEMATICS

SCORE POINT 0
(EXAMPLE A)



13

The two shapes are the
one next to the same one and
the one next to the triangle
there both the same.

a) Student's answer
is incorrect. (0 points)

b) Student's answer
is incorrect. (0 points)

SCORE POINT 0
(EXAMPLE B)



13

The Triangl has 3 sides
and the hexgon has 6 sides that's
one wigh there alike

a) Student gives no
response. (0 points)

b) Student's answer
is incorrect. (0 points)

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GRADE 5 MATHEMATICS**

DSP 4.5 For a probability event in which the sample space may or may not contain equally likely outcomes, **determines** the theoretical probability of an event and expresses the result as part to whole (e.g., two out of five).

14 A bag contains only red marbles and blue marbles.

- There are 6 marbles in the bag.
- The bag contains twice as many blue marbles as red marbles.

Nadia takes one marble from the bag without looking. What is the probability the marble is blue? Show your work or explain how you know.

Scoring Guide

Score	Description
2	Student correctly answers 4 out of 6 (or equivalent) , with work shown or explanation given.
1	Student gives correct answer but provides no work or explanation. OR Student's work or explanation shows correct strategy in determining probability (e.g., student answers $\frac{2}{6}$, with work that shows student is determining the probability of choosing red).
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Sample Response:

The bag contains twice as many blue as red, so the 6 marbles in the bag must be red, red, blue, blue, blue, blue (2 red and 4 blue).

So the probability of choosing blue is 4 out of 6 (or 2 out of 3).

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SCORE POINT 2
(EXAMPLE A)

14

63

$$2 \times 2 = 4$$

2 red
4 Blue

$\frac{4}{6}$ chance

Student's answer is correct,
with sufficient work shown.

SCORE POINT 2
(EXAMPLE B)

14

$\frac{2}{3}$ chance of
Nadia getting a blue marble
or $66\frac{2}{3}\%$ chance

6 marbles
2 red
4 blue

Student's answer is correct,
with sufficient work shown.

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GRADE 5 MATHEMATICS

SCORE POINT 1
(EXAMPLE A)

14

The chance for the is $\frac{4}{6}$


Student's answer is correct,
with no work shown or
explanation given.

SCORE POINT 1
(EXAMPLE B)

14

when Nadia takes 1 marble, it's a good chance of her picking out a Blue one

Graph:



because there are 2 red marbles and 4 blue marbles. $\odot = 1$ marble

key
B = Blue
R = Red

Student shows sufficient strategy
but does not determine probability.

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SCORE POINT 0
(EXAMPLE A)

14

It is probabaly blue because,
if she has twice as many
blue as she has red, she had
more blue, alot more.

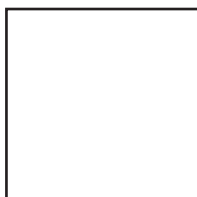
Student shows insufficient strategy and does not determine the probability that the marble is blue.

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GRADE 5 MATHEMATICS

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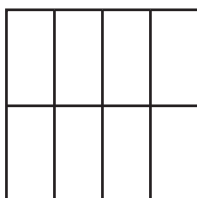
- 15 a. This square represents 1 pound of meat.



represents 1 pound of meat

Mr. Paulson uses $\frac{1}{4}$ pound of meat to make one hamburger. Shade the square to represent the amount of meat Mr. Paulson uses to make **three** hamburgers. Explain your reasoning.

- b. This square represents 1 pound of meat. The square is divided into 8 equal sections.



represents 1 pound of meat

Mrs. Paulson uses $\frac{1}{8}$ pound of meat to make one meatball. How many meatballs can Mrs. Paulson make using $\frac{1}{2}$ pound of meat? Explain your reasoning.

**NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS**

Scoring Guide

Score	Description
4	4 points
3	3 points
2	2 points
1	1 point OR Student shows minimal understanding of the relationship between fractions and parts of a whole.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

Part a: 2 points for correctly modeling $\frac{3}{4}$ with the square, with explanation provided
OR

1 point for the correct answer, with no work shown or explanation given
or
for correct strategy shown in solving the problem

Part b: 2 points for the correct answer, **4** (meatballs), with explanation provided
OR

1 point for the correct answer, with no work shown or explanation given
or
for correct strategy shown in solving the problem

Sample Response:

Part a: I divided the square into 4 equal pieces. One piece represents $\frac{1}{4}$ pound of meat. So I will need to shade 3 pieces to represent 3 hamburgers.

Part b: $\frac{1}{2}$ of the square is 4 pieces. Each piece represents $\frac{1}{8}$ pound. Since one meatball needs $\frac{1}{8}$ pound of meat, Mrs. Paulson can make 4 meatballs with $\frac{1}{2}$ pound of meat.

NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS

SCORE POINT 4
(EXAMPLE A)



15

a.



It would be that because $\frac{1}{4} +$

$$\frac{1}{4} + \frac{1}{4} = \frac{3}{4}.$$

b.



She can make 4 meatballs beca-

use $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{4}{8}$ & that is also equal to $\frac{1}{2}$

a) Student's answer (the model) is correct, with sufficient work shown. (2 points)

b) The student's answer (4) is correct, with sufficient explanation given. (2 points)

NECAP 2007 RELEASED ITEMS
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SCORE POINT 4
(EXAMPLE B)



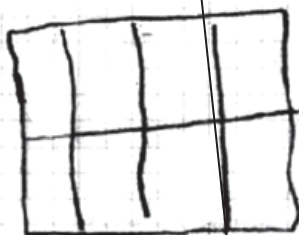
15

A.



If you shade in $\frac{1}{4}$ of the square for 1 hamburger then each hamburger you use $\frac{1}{4}$ of meat and so if you add on $\frac{1}{2}$ more hamburgers than you need to take $\frac{2}{4}$ more of meat from the square, and $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$.

B.



Mrs. Paulson can make 4 meatballs because in $\frac{1}{2}$ of the square there is $\frac{4}{8}$, and each meatball represents $\frac{1}{2}$ so $\frac{4}{8} = 4$ meatballs.

a) Student's answer (the model) is correct, with sufficient work shown. (2 points)

b) Student's answer (4) is correct, with sufficient explanation. (2 points)

NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS

SCORE POINT 3
(EXAMPLE A)



15



a) Student's answer (the model) is correct, with insufficient explanation given. (1 point)



b) Student's answer (4) is correct, with sufficient work shown (the model). (2 points)

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SCORE POINT 3
(EXAMPLE B)



15



I knew it was one fourth
so I put it in to fourths
and colored three.

a) Student's answer (the model) is correct, with sufficient explanation given. (2 points)




It said shade a half so
I did.

b) Student shows correct strategy (the model), without a correct answer. (1 point)

NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS

SCORE POINT 2
(EXAMPLE A)

15




$\frac{1}{2}$ of the square is 4 peace
each peace is use to make
1 meatball so she can make
4 meatballs.

a) Student gives no response.
(0 points)

b) Student's answer (4) is correct,
with sufficient explanation given.
(2 points)

SCORE POINT 2
(EXAMPLE B)

15



4 meatballs

4 meatballs

a) Student's answer (the
model) is correct, with no
explanation given. (1 point)

b) Student's answer (4) is
correct, with no explanation
given. (1 point)

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SCORE POINT 1
(EXAMPLE A)



15



a) Student's answer (the model) is correct, with no explanation given. (1 point)

8 because?

b) Student's answer is incorrect, with no work shown or explanation given. (0 points)

NECAP 2007 RELEASED ITEMS
GRADE 5 MATHEMATICS

SCORE POINT 0
(EXAMPLE A)



15



this is one out of four becaus
I only shaded 1 out of four.

a) Student's answer (the model)
and explanation are incorrect.
(0 points)

$$\frac{1}{8} - \frac{1}{2} = \frac{1}{2} = 6 \text{ meters because were subtracting } \frac{1}{8} \frac{1}{2} = \frac{1}{6}$$

b) Student's answer and
explanation are incorrect.
(0 points)